



Medal struck in 1948 by the University of Pisa to commemorate Giovanni Vitali (<http://numismatica-italiana>).

The Paratympanic Organ of Vitali in migratory birds: Research failure or challenge ?

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The discovery of the Paratympanic Organ (PTO) in birds by Giovanni Vitali in 1911 was once considered for the Nobel Prize.

Vitali (1876-1963) was one of the 24 short-listed from 99 Researchers selected for the Nobel Prize in 1934. He was Professor of Human Anatomy at University of Pisa until 1946. Angelo Ruffini (1864-1929) who discovered “Ruffini's corpuscle”, reported the discovery by Vitali in a paper published in 1920 . More recently, in January 2013 Francesco Giannessi, one of the last Professors at the School of Vitali at the Institute of Human Anatomy in the University of Pisa -Italy - published with cooperation of co-authors Riccardo Ruffoli and Christopher S.von Bartheld (Dept.of Physiology and Cell Biology , University of Nevada , USA) the most important tribute to celebrate the importance of the work and discovery of Giovanni Vitali .

The paper entitled *Giovanni Vitali : Discoverer of Paratympanic organ* was published on *Annals of Anatomy* (2013 Jan.:195-1-:5-10) and offers a complete overview about the Biography of Giovanni Vitali, viz.: The fate of epibranchial placodal thickenings, *The distribution of the PTO among*

species and its evolution, The morphology of the PTO and verification of its sensory nature , Investigations and speculation about the function of the PTO, and an overview of the history and research evolution of the PTO. Giannessi and co-authors wrote : Clarification of the functional role of the PTO, which is used daily by an enormous number of living animals (200-300 billion of birds) represents currently one of the major unsolved mysteries and challenges in sensory physiology of vertebrates. It seems to us that this consideration is still an important incentive to revive the mystery of the PTO. It is a fascinating field of research, unfortunately still neglected by young researchers.

In 2013, in parallel with the paper of Giannessi *et al*, a researcher from North Europe , Paul Wildlifewriter has written a complete overview about the work of Vitali (<http://thewildlifewriter.blogspot.com.au/2013/09/skyscanner.html>).

He concludes:

Nonetheless, Vitali's findings caused a sensation at the time, with many follow-up papers and nominations for the Nobel prize flying around even faster than the birds he was studying. But even then, things were changing... in a few short years, war would stalk across the face of Europe and the mainly Italian and German science journals in which Vitali's work was published fell silent, some of them never to reappear.

...

During the middle part of the 20th century, the strange story of the “organ of flight” passed quietly into the annals of Science and was almost forgotten.....

"Strange story" is surely the correct phrase to describe a possible new modern focus on the PTO, particularly if we compare the tremendous powers of the modern technologies with the ancient microscope of Vitali conserved in his old Institute . But the full story, despite many other contributions in literature (most of them repeating that research on the PTO is still a challenge), remains in a mystery .

The question is " failure or challenge " ?

Probably we must say to the young researchers something like "J'accuse" to stimulate curiosity and new methodologies of investigations both experimental and "in the field".

On our own way we have tried to contribute to the knowledge of the PTO by investigating the organ's roll in migrational behaviour: our modest research provides evidence that the PTO provides the mechanism by which increasing atmospheric pressure provides the signal for birds to commence migration .

References

Ruffini A. (1929) “Sull’ organo paratimpanico di G. Vitali od organo del volo degli uccelli.” *Boll. sci. med. Soc. Med – chir. Bologna* pp141-154.

Other the References in the present paper may be found at <http://www.scienceheresy.com/ornithologyheresy/index.html>